UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/702,200	11/04/2003	Ryoji Kubo	1232-5191	7121

27123 7590 06/02/2008
MORGAN & FINNEGAN, L.L.P.
3 WORLD FINANCIAL CENTER
NEW YORK, NY 10281-2101

EXAMINER	
CUTLER, ALBERT H	
ART UNIT	**PAPER NUMBER**
2622	

NOTIFICATION DATE	DELIVERY MODE
06/02/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTOPatentCommunications@Morganfinnegan.com
Shopkins@Morganfinnegan.com
jmedina@Morganfinnegan.com

Office Action Summary	Application No.	Applicant(s)	
	10/702,200	KUBO, RYOJI	
	Examiner	Art Unit	
	ALBERT H. CUTLER	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _04 February 2008_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _16 and 17_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _16 and 17_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to communication filed on February 4, 2008. Claims 16 and 17 are pending in the application and have been examined by the Examiner.

Response to Arguments

2. Applicant's arguments with respect to claim 16 have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

3. Claim 17 is objected to because of the following informalities: Lack of clarity and precision.

Claims 17 recites, "the apparatus according to claim 11". However, claim 11 has been cancelled by Applicant. Upon further examination, it appears that claim 17 is meant to depend from claim 16. Therefore, the Examiner will interpret claim 17 to read, "the apparatus according to claim 16". Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 6,963,374) in view of Anderson (US 6,847,388) and Taniguchi et al. (US 5,619,347).

Consider claim 16, Nakamura et al. teaches:

An image sensing apparatus ("Digital Camera", figures 1-4, column 2, line 56 through column 4, line 43) comprising:

an image sensing device ("CCD", 303, figure 4) which outputs image data obtained by an image sensing element as RAW data (column 3, lines 50-58);

a memory ("DRAM", 232, figure 4) which has a first area for temporally storing first RAW data obtained in a first image sensing operation of said image sensing device and for temporally storing second RAW data obtained in a second image sensing operation next to the first image sensing operation of said image sensing device (See figure 7, column 7, lines 10-49. First raw image data is written into the DRAM (232) over channel 1. During a subsequent image capture operation, this first raw data is read out of DRAM (232) over channel 2 for image processing, as second image data is written into the DRAM (232) over channel 1.);

a white balance integration device (211a, figure 6A) which integrates at least one of the first and second RAW data for a white balance processing (The white balance

integration device (211a) is part of the image signal processor (211, figure 4). The RAW image data is subjected to white balance processing, and then stored into the DRAM (232), column 6, lines 21-26.);

an image processing device (211, figure 4) which performs image processing of the first and second RAW data readout from said memory (The image processing device (211) performs processing such as color space conversion on the RAW data readout from memory (232), column 4, lines 8-10, column 6, lines 26-36, column 7, lines 24-33.),

a display device ("EVF", 20, or "LCD", 10, figure 4) which displays an object image during imaging on the image sensing element (The display acts as a "live view display" (i.e. an object image is displayed during imaging), column 3, lines 16-23.); and

a control device ("main CPU", 21, figure 4) which controls said memory (232), said white balance integration device (211a), said image processing device (211), and said display device (20, 10, column 4, lines 1-27. The main CPU (21) comprises the image processing device (211) which contains the white balance integration device (211a), a bus controller (218) for controlling the memory (232), and a video encoder (213) which supplies analog image signals to the display.),

wherein, in case said image sensing device outputs third RAW data obtained in a third image sensing operation next to the second image sensing operation (See figure 7. Steps 1, 8 and 10-12 comprise a continuous loop. Because of this, it is clear that third RAW data, fourth RAW data, etc. can be output by the image sensing device without altering the camera operation.), said control device (21) controls so that, said

image processing device (211) processes a color space conversion for the first RAW data readout from said memory (232) in accordance with start of exposure/storage of the second RAW data from the image sensing element (303) in the second image sensing operation (See figure 8, column 7, lines 24-33. A frame of raw data obtained by an immediately preceding image (i.e. first image data) is read out of DRAM (232) and subjected to color space conversion while second image data is obtained through exposure and storage of the CCD.), and said display device ("LCD", 10) displays the object image (See "Live View Display" on the right side of figure 8.) after the color space conversion processing for the first RAW data (See "Pc", figure 8) and the integral processing (See Readout 2, "Pe", figure 8) for the second RAW data (See column 7, lines 24-49. The LCD exhibits a "Live View Display" after the color space conversion "Pc" and integral processing "Pe".).

However, Nakamura et al. does not explicitly teach that said memory (232) has a second area for storing the second RAW image data, or that said memory stores the third RAW data in the first area in which the first RAW data after processing of the first RAW data by said image processing device is finished. Nakamura et al. further does not explicitly teach that the processing device processes a color space conversion for the first RAW data readout from said first area in accordance with start of reading the second RAW data from the image sensing element.

Anderson is similar to Nakamura et al. in that Anderson teaches of a camera (figures 1-3) with a memory (figure 4a). Anderson also similarly teaches of reading out raw image data from an image sensor (114, figure 1, column 5, lines 59-64), storing the

data in a memory (530, column 5, line 59 through column 6, line 3), and subsequently performing color space conversion on the image data (column 8, line 59 through column 9, line 7).

However, in addition to Nakamura et al., Anderson teaches that said memory (figures 4a and 4b) has a second area (Input buffer, 2, B) for storing the second RAW image data, that said memory stores the third RAW data in the first area in which the first RAW data after processing of the first RAW data by said image processing device is finished, and that the processing device processes a color space conversion for the first RAW data readout from said first area in accordance with start of reading the second RAW data from the image sensing element (See figure 4a, column 4, line 59 through column 6, line 3, column 6, lines 38-56, column 8, line 59 through column 9, line 8. Anderson teaches, "Referring again to FIG. 4B, the ping-pong buffers are utilized during live view mode as follows. While input buffer A is filled with image data, the data from input buffer B is processed and transmitted to frame buffer B. At the same time, previously processed data in frame buffer A is output to the LCD screen 402 for display. While input buffer B is filled with image data, the data from input buffer A is processed and transmitted to frame buffer A. At the same time, previously processed data in frame buffer B is output to the LCD screen 402 for display." As one buffer (i.e. the second area) is filled with raw image data (i.e. the start of reading of the second RAW data from the image sensing element), the other buffer (i.e. the first area) is emptied and processed (i.e. first RAW data is readout from the first area), which processing involves color space conversion (See 612, figure 7, column 8, line 59

through column 9, line 8). Anderson teaches that the input buffers A and B alternate between an input cycle and a processing cycle, column 6, lines 8-10. Therefore, buffer A is an input buffer during a first phase, an output buffer during a second phase when second RAW data is written into buffer B, and again an input buffer during a third phase when third RAW data is output from the sensor an into memory. Thus, the third image data is stored in the same area (i.e. buffer A) as the first image data during the third phase, after the first image data is processed during the second phase.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to use ping-pong buffers as taught by Anderson in the camera taught by Nakamura et al. to read out raw image data from the image sensor concurrent with the processing color space conversion of previous image data, for the benefit of improving the display speed of the digital camera and preventing the tearing of the image on the display (Anderson, column 5, line 65 through column 6, line 3.).

Nakamura et al. alone does not explicitly teach that the integral processing for the second RAW data by said white balance integration device and the color space conversion for first RAW data by said image processing device processes are performed in parallel during reading of the second RAW data from the image sensing element. However, because the white balance integration taught by Nakamura et al. is performed during the raw data writing ("Pe"), and thus in parallel with the readout of the second image data (see figure 8, column 7, lines 41-49), the combination of Nakamura et al. and Anderson teaches that that integral processing of the second image data and the color space conversion of

the first image data are performed in parallel. This is because Anderson modifies Nakamura et al. such that the image processing of the first image data (which includes color space conversion) readout from the first area of memory takes place concurrently with the readout of second RAW image data from the image sensor (which includes integration) and into the second area of memory, as discussed above.

However, the combination of Nakamura et al. and Anderson does not explicitly teach a white balance calculation device which calculates a white balance coefficient on the basis of the integration result by the white balance calculation, or that the image processing is performed in accordance with the white balance coefficient calculated by said white balance calculation device.

Taniguchi et al. is similar to Nakamura et al. in that Taniguchi et al. teaches performing white balance (column 1, lines 9-15) on image data stored in a picture memory (12, figure 1, column 9, lines 42-60). Taniguchi et al. also similarly teaches of a white balance integration device (15, 16, figure 1, column 9, line 63 through column 10, line 8).

However, in addition to the teachings of Nakamura et al. and Anderson, Taniguchi et al. teaches of a white balance calculation device ("white balance coefficient calculating unit", 22, figure 1) which calculates a white balance coefficient on the basis of the integration result by the white balance calculation (See figure 1, column 10, lines 45-60. The white balance calculation device (22) calculates a white balance coefficient according to a plurality of factors determined in units 17-21 of figure 1, based upon the

white balance integration of the white balance integration device (15,16). See also column 10, lines 6-44.), and that the image processing is performed in accordance with the white balance coefficient calculated by said white balance calculation device (See 14, figure 1, column 9, lines 50-60, column 10, lines 56-60. Image processing is performed by the white balance adjusting unit (14) based upon the white balance coefficient calculated by the white balance coefficient calculating unit (22).).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have the image processing device taught by the combination of Nakamura et al. and Anderson comprise a white balance calculation device and perform white balance processing based upon a calculated white balance coefficient as taught by Taniguchi et al. for the benefit of performing a sufficient degree of white balance adjustment appropriate to a colored picture without any erroneous adjustment or adverse influence due to a high chromaticity region of the colored picture (Taniguchi et al., column 2, lines 40-50).

The combination of Nakamura et al., Anderson, and Taniguchi et al. teaches that said white balance calculation device (taught by Taniguchi et al.) calculates the white balance coefficient (see above rationale) while said display device displays the object image after the parallel processing. Anderson teaches that parallel processing is performed by utilizing two buffers, column 6, lines 47-56. Anderson teaches that the image data from one buffer is displayed on the LCD (402) as the image data from the other buffer is processed, column 6, lines 47-56. Therefore, an object image is

continuously displayed on the display, including any time when a white balance coefficient is being calculated.

7. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (US 6,963,374) in view of Anderson (US 6,847,388) and Taniguchi et al. (US 5,619,347) as applied to claim 16 above, and further in view of Sasaki (US 6,961,085).

Consider claim 17, and as applied to claim 16 above, the combination of Nakamura et al., Anderson, and Taniguchi et al. teaches that said display device displays the object image after said white balance calculation device calculates the white balance coefficient (See claim 16 rationale. Anderson teaches of a continuous display.). However, the combination of Nakamura et al., Anderson, and Taniguchi et al. does not explicitly teach a defect correction device.

Sasaki is similar to Nakamura et al. in that image data is collected from the image sensor (12, figure 1), preliminary processing is performed to yield first image data (see step 41, figure 7) which is written into a buffer memory (26a, figure 7). Sasaki also similarly teaches that the first image data is read from the buffer memory (step 42, figure 7) for additional processing (see column 10, lines 1-57).

However, in addition to the combined teachings of Nakamura et al., Anderson, and Taniguchi et al., Sasaki teaches that the apparatus further comprises a defect correction device which corrects a defective pixel portion of image data when the image

sensing element has a defective pixel (See column 10, lines 21-57. Sasaki teaches that the locations of defective pixels are stored in memory, and when reading the data output from the buffer (26a), the defective pixels are corrected.), and that a control device controls said defect correction device in such a way that said defect correction device corrects a defective pixel portion of the image data (See column 10, lines 29-31, lines 37-41.).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time of the invention to have a defect correction device for correcting defective pixels as taught by Sasaki correct defective pixels in the image processing device during the display of the object image as taught by the combination of Nakamura et al., Anderson and Taniguchi et al. for the benefit of keeping the influence of a defective pixel to a minimum and preserving a high-definition image (Sasaki, column 3, lines 1-5, lines 12-16).

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALBERT H. CUTLER whose telephone number is (571)270-1460. The examiner can normally be reached on Mon-Thu (9:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan V Ho can be reached on (571)-272-7365. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AC
05/23/2008

/Ngoc-Yen T. VU/
Supervisory Patent Examiner, Art Unit 2622